RIVER STAGES AND FLOODS

By C. R. JORDAN

PRECIPITATION during June was below normal over the southern half of the country with the exception of western Texas, New Mexico, western Colorado, and Utah. It was also below normal in the central Lake region and most of Oregon. Extremely dry weather prevailed in the central Appalachians and Atlantic coastal States and drought conditions in this area spread to embrace the major parts of 10 States. In contrast to the dry weather of May in central New England States, the month was the wettest June of record for some localities. Heavy precipitation also occurred over most of the area from the western Lake region westward to the northern Rocky Mountain and the northern Great Basin.

Damaging floods occurred for the third consecutive month in the West Central States of the Mississippi Valley. Local floods occurred in New England, West Virginia, Montana, and Utah.

Hudson Bay Drainage.—Minor floods occurred in the Red River of the North at Wahpeton and Fargo, N. Dak., during the early part of June. The rise resulted from a series of thunderstorms attending a depression which was over the Dakotas on June 3–4. Unofficial amounts of precipitation of 6 to 7 inches were reported at White Rock, S. Dak., and Wheaton, Minn. Only slight damage resulted from the overflow.

Atlantic Slope Drainage.—Local flash floods occurred at several places, particularly in central Massachusetts and southern New Hampshire, where frequent showers and thunderstorms began on June 17 and continued until June 25. Some showers were of torrential intensity with a number of stations averaging more than 5 inches in a matter of a few hours. At Hubbardston, Mass., the Department of Public Health reported a rainfall of 5.76 inches in less than 2 hours on June 25. Many of the smaller streams experienced the highest floods since the hurricane flood of 1938, but crest stages were well below previous maxima.

MISSISSIPPI SYSTEM

Ohio Basin.—Heavy rain accompanying a tornado in the vicinity of Salem, W. Va., on the 23d, caused two streams, Salem Fork and Jacob Run, converging in the business district of Salem, to overflow and flood the main street of the town with 3 to 7 feet of water. Considerable damage was done to crops and gardens and farm lands in the vicinity.

Upper Mississippi Basin.—Outstanding floods occurred in the West Central States for the third consecutive month. As during May, the flood area was centered in Iowa but extended from Wisconsin to Kansas and Oklahoma. Overflows resulted mainly from torrential rains with 24-hour amounts exceeding 5 inches at several places in Iowa. The soil was generally well soaked and most streams were at high levels from the earlier rains of April and May which were important factors contributing to the flood heights reached.

Beginning about June 12 and continuing at intervals until the 27th, heavy to excessive rains, centered in Iowa, built up the prevailing stream stages and caused flash floods on the smaller streams and general floods of less severity on the larger rivers. The crest stage of the Cedar River at Cedar Rapids, Iowa, was 12.4 feet on June 18 and was the highest June stage of record. On June 25 and 26 locally excessive rains, with unofficial amounts up to 10 inches, occurred over the Middle, Cedar, Maquoketa, and Wapsipinicon Basins. A record stage of 24.7 feet resulted at Maquoketa, Iowa, on the 29th. A number of the smaller streams in eastern Iowa reached the highest stages since 1902. Severe floods were reported in the headwaters of the Des Moines River Basin. Flood crests in the Raccoon and Des Moines Rivers were from 1 to 5 feet lower than the floods of May. Moderate to severe flood stages occurred along the Mississippi River from Fort Ripley, Minn., to Chester, Ill., with the highest stages since 1922 reported from Clinton to Muscatine, Iowa.

Missouri Basin.—Heavy rainfall during the early part of June in the Floyd River Valley caused rather serious flood conditions above Sioux City, Iowa, both on the main Floyd River and the West Branch. Rainfall was not only heavy but frequent and much of the damage was caused by rainfall rather than stream overflow. A stage of 19.2 feet was recorded at James, Iowa, on the 16th, the highest stage recorded at this station since it was established about 5 years ago. Moderate overflow occurred along the Big Sioux River from Sioux Falls, S. Dak., to Sioux City, Iowa.

Excessive rainfall at many places in Madison, Stanton, Colfax, Dodge, Cuming, and Burt Counties in Nebraska produced the worst flood in years, if not of record, in the Elkhorn Valley from below Stanton practically to the mouth of the river. Overflow was especially severe in the vicinity of Scribner, Hooper, and Waterloo. Damage amounted to several million dollars.

Light flooding occurred during the month at scattered points along the Solomon, Little Blue, Big Blue, and Grand Rivers.

The "annual rise" of the Missouri River prevailed throughout June, with moderately high stages resulting from the mouth of the Yellowstone River to Omaha, Nebr. The following report was received from the Weather Bureau Regional Office, Kansas City, Mo.:

> On June 11, 1944, the Missouri River in the Kansas City river district was from 3 to 5 feet below flood stage. Snow melt was approaching the annual peak in the upper Yellowstone but had not reached Williston, N. Dak. The flow at Bismarck on this date was about 60,000 cfs. It requires about 100,000 cfs to produce flood stage at Nebraska City. Flow from the Platte and Kansas Rivers was normal.
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> During the night of June 10–11, torrential rains fell in the Elkhorn Basin, northwest of Omaha. Unofficial measurements indicate amounts as high as 16.0 inches. Heavy rains were general over eastern Nebraska and western Iowa although in most cases the amounts were not in excess of 2.00 inches.
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> During the night of June 12–13, heavy rains averaging 2 inches fell over the area between Omaha and St. Joseph, indicating that serious flood conditions should be expected from Omaha, Nebr., to St. Joseph, Mo. Stages were extremely high in the Nebraska City–St. Joseph area, the St. Joseph stage being the highest since 1917 and the Nebraska City stage being only 0.2 foot lower than the all-time record stage of 19.9 feet that occurred April 14, 1943. One of the outstanding features of the flood was the prolonged high flow. This was caused by heavy upstream inflow from melting snow and heavy rains in Montana and North Dakota during the period June 17–19. The river was above flood stage at St. Joseph from June 15 to July 7, and at Nebraska City from June 12 to the date of this report (July 14). Below St. Joseph, Mo., there was a flattening-out of the flood crest and only about bankful stages occurred below there. Damage to levees and prospective crops was extremely high due to the long period of inundation.

Arkansas Basin.—Flood stages were slightly exceeded at a number of stations along the tributaries of the Arkansas River and bankful stage was reached on the Arkansas River at Great Bend, Kans. Very little damage resulted from these overflows.

Red Basin.—A few stations along the Ouachita, Black, and Sulphur Rivers remained above flood stage during the early part of June from May floods. The streams fell steadily and were all below flood stage by the middle of the month.

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Lower Mississippi Basin.—Stages in the Atchafalaya and lower Mississippi Rivers fell steadily from high stages that occurred for the most part during the latter part of May.

West Gulf of Mexico Drainage.—Light to moderate flooding continued during the early part of June along the Sabine, Trinity, Guadalupe, Nueces, and Rio Grande Rivers. Overflow was light and little or no damage resulted during June.

FLOOD-STAGE REPORT FOR JUNE 1944

[All dates in June unless otherwise indicated]

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
HUDSON BAY DRAINAGE	*Feet*			*Feet*	
Red of North:					
Wahpeton, N. Dak.	6	5	8	8.0	6
Moorhead, Minn.	17	7	12	20.0	10
ATLANTIC SLOPE DRAINAGE					
Contoocook: Penacook, N. H.	7	25	27	7.3	26
Nashua: East Pepperel, Mass.	8	25	28	10.8	27
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Rock: Moline, Ill.	10	27	27	10.1	27
Cedar: Waterloo, Iowa	12	17	17	13.2	17
Iowa:					
Iowa City, Iowa	16	19	19	16.1	19
Wapello, Iowa	10	18	29	14.3	20–21
				13.0	28
Skunk: Augusta, Iowa	15	18	20	15.2	19
Raccoon: Van Meter, Iowa	13	13	19	17.1	16
Boone: Webster City, Iowa	10	14	16	13.9	14
Des Moines:					
Boone, Iowa	20	14	17	23.6	16
Des Moines, Iowa	23	17	17	23.4	17
Tracy, Iowa	14	9	23	18.8	19
Eddyville, Iowa	15	9	24	20.25	19
Ottumwa, Iowa	9	9	24	12.6	11
				14.3	19–20
Mississippi:					
Fort Ripley, Minn.	10	7	20	11.1	14–15
St. Paul, Minn.	14	20	22	14.2	21
Hastings Dam, Minn.	15	18	23	15.2	21–22
Winona, Minn.	13	23	23	13.0	23
La Crosse, Wis.	12	21	25	12.3	22–23
Dubuque, Iowa	18	26	29	19.0	26
Gordons Ferry, Iowa	13	May 15	3	15.5	May 25
		14	July 6	17.3	28
Clinton, Iowa	16	21	July 3	18.6	28
Le Claire, Iowa	12	28	30	12.3	29
Davenport, Iowa	15	28	July 1	16.5	29
Muscatine, Iowa	15	20	July 5	19.0	30
Keithsburg, Ill.	12	18	July 5	15.4	29
Burlington, Iowa	15	21	(2)	16.6	30
Keokuk, Iowa	12	10	(2)	17.25	23
Gregory Landing, Mo.	12	May 19	7	21.1	May 28–29
		10	(2)	16.8	23
Quincy, Ill.	14	9	(2)	19.2	23
Hannibal, Mo.	13	Apr. 21	(2)	19.6	Apr. 26
				22.5	May 28
				19.2	24
			(2)	19.2	Apr. 26
Louisiana, Mo.	12	Apr. 21		13.2	May 6, 10
				19.8	May 28
				13.6	12
				17.0	24–25
Grafton, Ill.	18	May 26	9	21.9	1
		24	(2)	19.1	27–28
Chester, Ill.	27	2	3	27.1	2
Missouri Basin					
Big Sioux: Akron, Iowa	12	12	20	17.0	18
Floyd:					
Merrill, Iowa	13	12	13	13.6	12
James, Iowa	14	5	21	19.2	13
Elkhorn: West Point, Nebr.	12	11	14	14.6	12
Solomon: Beloit, Kans.	18	13	13	18.25	13
		20	21	24.65	21
Little Blue:					
Endicott, Nebr.	11	13	13	12.4	13
Hanover, Kans.	14	4	5	16.4	4
		13	14	17.0	14

FLOOD-STAGE REPORT FOR JUNE 1944—Continued

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM—continued					
Missouri Basin—continued					
Big Blue:	*Feet*			*Feet*	
Beatrice, Nebr.	16	13	14	20.2	13
Barnston, Nebr.	18	4	5	22.2	4
		13	15	23.85	14
		20	21	22.2	20
Blue Rapids, Kans.	20	4	5	23.5	4–5
		13	15	25.9	13–14
Grand:					
Gallatin, Mo.	20	9	10	22.8	10
Chillicothe, Mo.	18	9	11	27.0	11
Brunswick, Mo.	12	10	(2)	14.4	15
				15.5	21
Missouri:					
Blair, Nebr.	18	13	(2)	19.6	17
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Nebraska City, Nebr.	15	12	(2)	19.7	15
St. Joseph, Mo.	17	14	(2)	19.1	18–19
Kansas City, Mo.	22	20	21	22.1	21
		24	24	22.3	24
Lexington, Mo.	22	16	29	23.8	20
Waverly, Mo.	18	13	(2)	20.9	20
Boonville, Mo.	21	21	24	21.3	22
St. Charles, Mo.	25	24	26	25.05	25
Arkansas Basin					
Cimarron: Perkins, Okla.	11	14	14	11.9	14
Neosho: Oswego, Kans.	17	21	22	18.4	21
North Canadian: Yukon, Okla.	11	13	14	15.0	13
Poteau: Poteau, Okla.	21	14	15	24.0	14
Petit Jean: Danville, Ark.	20	15	16	20.3	15
Arkansas: Great Bend, Kans.	8	3	3	8.0	3
Red Basin					
Ouachita: Monroe, La.	40	May 3	12	45.5	May 18–19
Black: Jonesville, La.	50	May 4	16	53.4	May 23–24
Sulphur:					
Hagansport, Tex.	38	May 27	1	39.2	May 28
Naples, Tex.	22	May 29	9	26.6	1
Lower Mississippi Basin					
Yazoo: Yazoo City, Miss.	29	Mar. 28	3	30.8	Mar. 29
				33.65	Apr. 27
				34.1	May 5
Mississippi:					
Red River Landing, La.	45	Apr. 28	1	50.8	May 18–19
Baton Rouge, La.	35	Apr. 24	2	41.3	May 17–23
Donaldsonville, La.	28	Apr. 29	1	32.6	May 18–23
Reserve, La.	22	May 1	30	25.3	May 18–22
New Orleans, La.	17	May 2	30	19.4	May 21
Atchafalaya:					
Simmesport, La.	41	May 5	1	45.45	May 22
Melville, La.	37	Apr. 28	3	41.4	May 20–23
Atchafalaya, La.	25	Apr. 10	8	26.4	May 22–28
Morgan City, La.	6	2	6	6.3	5
		9	10	6.0	9–10
WEST GULF OF MEXICO DRAINAGE					
Sabine:					
Gladewater, Tex.	26	3	12	30.9	6
Logansport, La.	25	May 1	4	35.05	May 6
				34.6	May 15
Bon Wier, Tex.	17	May 3	14	22.6	May 10
				21.5	May 28–29
East Fork: Rockwall, Tex.	10	7	8	10.7	8
Trinity:					
Rosser, Tex.	26	May 26	5	29.3	3
Trinidad, Tex.	28	May 26	8	32.2	7
Liberty, Tex.	24	8	15	24.8	11–12
Guadalupe: Victoria, Tex.	21	May 30	2	23.5	1
Nueces: Cotulla, Tex.	15	May 30	May 31	15.7	May 31
Rio Grande:					
Lobatos Bridge, Colo.	4	May 11	8	6.1	May 18
				5.6	May 26, June 3
		12	18	4.6	12
Embudo, N. Mex.	8	May 12	8	11.2	May 18–19
				10.0	3
Espanola, N. Mex.	7	May 11	6	8.9	May 17
				8.0	3
GULF OF CALIFORNIA DRAINAGE					
Animas: Durango, Colo.	4	----------	----------	5.7	11

[1] Provisional.

[2] Continued at end of month.